

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
13 October 2005 (13.10.2005)

PCT

(10) International Publication Number  
**WO 2005/096086 A1**

(51) International Patent Classification<sup>7</sup>: G02F 1/22S,  
1/17, 1/01

(21) International Application Number:  
PCT/EP2004/003627

(22) International Filing Date: 31 March 2004 (31.03.2004)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant (for all designated States except US): PIRELLI & C. S.P.A. [IT/IT]; Via Gaetano Negri, 10, I-20123 Milano (IT).

(72) Inventors; and

(75) Inventors/Applicants (for US only): GHIDINI, Silvia [IT/IT]; Pirelli Labs S.p.A., Viale Sarca, 222, I-20126 Milano (IT). NESPOLA, Antonio [IT/IT]; Pierlli Labs S.p.A., Viale Sarca, 222, I-20126 Milano (IT).

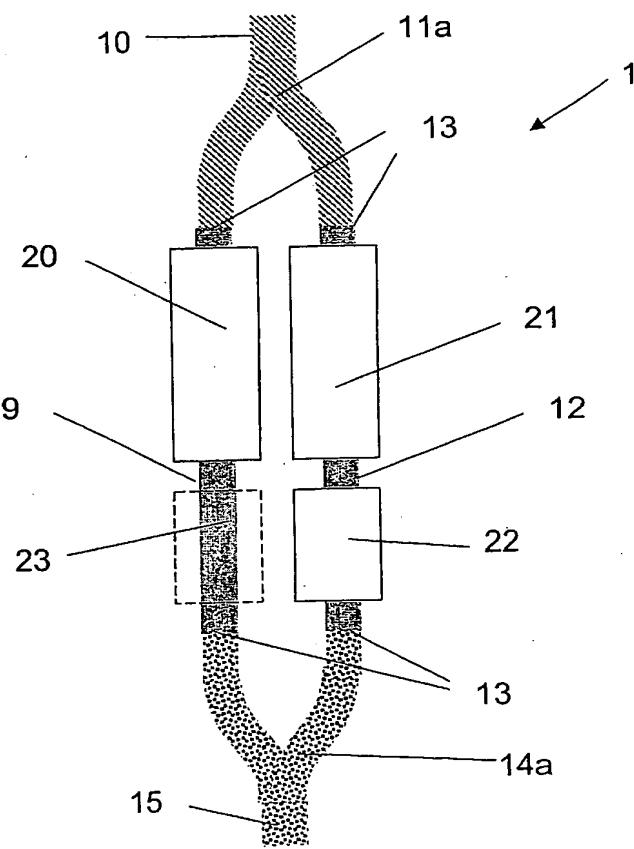
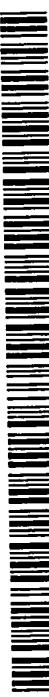
(74) Agents: GIANNESI, Simona et al.; Porta, Checcacci & Associati S.P.A, Via Trebbia, 20, I-20135 Milano (IT).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,

*[Continued on next page]*

(54) Title: OPTICAL MODULATOR



WO 2005/096086 A1

(57) Abstract: An optical modulator (1) comprising an optical splitter (11a; 11b) for splitting an input light beam into a first and second light beam; a first and a second waveguide arm (9, 12) connected to said optical splitter (11a; 11b) for receiving and transmitting therethrough said first and second light beam, respectively, said waveguide arms (9, 12) each including a core region (32) comprising a group IV semiconductor material or a combination of group IV semiconductor materials; an optical combiner (14a; 14b) connected to said first and second waveguide arm (9, 12) for receiving said first and second light beam and combine them into an output light beam, a first and a second electrode structure (20, 21) associated with said first and second waveguide arm (9, 12), respectively; a driving circuit (80) for supplying voltage to said first and second electrode structure (20, 21), characterized in that said driving circuit (80) is adapted to supply a first modulation voltage superimposed to a first bias voltage to the first electrode structure (20) and a second modulation voltage superimposed to a second bias voltage to the second electrode structure (21).



TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,  
ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

— *with international search report*